

in the British Museum (the history of which has been forgotten, but which was probably one of the treasures obtained in the voyage of the 'Erebus' and 'Terror'), and one in the Museum at the Jardin des Plantes, Paris (which is the type-specimen figured and referred to in the 'Voyage de l'Astrolabe').

It now only remains for me to add what little information I have been able to collect with reference to the habits of this curious bird.

We learn from MM. Quoy and Gaimard (*loc. cit.*) that, like most other shore-birds, it is gregarious, frequenting the sea-coast in small flocks, and living probably on food similar to that sought by marine Sandpipers. Imitating the Turnstone (*Streptilas*) in its search for this, its peculiar form of bill enables it with ease to probe the crevices of the rock or shingle and seize any lurking insect or small crustacean, affording us, in this respect, a remarkable illustration of structure adapted to the peculiar mode of life which the bird pursues.

XXVIII.—*Notes on Mr. Lawrence's List of Costa-Rica Birds.*

By OSBERT SALVIN, M.A. &c.

ABOUT a year ago Mr. Lawrence communicated to the Lyceum of Natural History of New York a paper on the birds of Costa Rica, which was afterwards published in the form of a catalogue*, being based chiefly upon specimens in the Smithsonian Institution of Washington. Mr. Lawrence's own collection furnished additional material; and the names of some birds mentioned by Dr. Cabanis were also introduced, as well as others which were, so far as I can recollect, communicated by myself to Prof. Baird, in a rough list I once drew up of some of Arcé's collections, more with the view of giving some idea of what we possessed in this country than with the intention of its ultimate publication. Amongst the last-mentioned species are some whose names were erroneously determined, others are included which should have been omitted, whilst some, again, are

* [This is the Catalogue before mentioned in these pages (*suprà*, pp. 110, 222.—ED.]

omitted which might have been added to the number. My present object is rather to correct the errors for which I am responsible, the specimens being now before me. At the same time I shall take the opportunity of adding remarks on other species, either in confirmation of Mr. Lawrence's views or the reverse, and thus trust I shall render his most useful Catalogue more complete than it stands at present.

I believe nearly the whole series of bird-skins contained in the Smithsonian Institution were collected in the line of country which stretches from the Gulf of Nicoya on the Pacific, across the tablelands surrounding San José and Cartago, and thence towards the Atlantic as far as Angostura and Tucurriqui in the valley of the Reventazon. Collections were also made in the Dota Mountains to the southward of this line; and the Volcano of Yrazu (or Cartago, as it is as frequently called) was also visited. Mr. Lawrence has not defined the limits of the country the birds of which he catalogues, and leaves the south-eastern boundary in some obscurity, as he includes the species collected by Warszewiez in his journey from Chiriqui to Boca del Toro, but leaves out those obtained at Chiriqui by Bridges and Mr. Hicks. The political territory of Costa Rica does not by itself form a natural zoological subdivision of the fauna of Central America; but by extending its limits northwards as far as the Lake of Nicaragua and the River San Juan, or perhaps further, and southwards so as to include the Isthmus of Panama, and perhaps that of Darien, we arrive at a section of the great Central-American Isthmus which contains a bird-fauna sufficiently peculiar to be treated as a well-defined subdivision of the bird-fauna of the whole country extending from Southern Mexico to the Isthmus of Darien. But for the present I will confine my notes, as Mr. Lawrence has done, to the birds of the State of Costa Rica, leaving a general view of the relationship of its birds for more special consideration.

Mr. Lawrence's catalogue comprises the "Land-birds" only; and he prefaces his list by enumerating the birds which have occurred in the districts adjoining Costa Rica, and which may therefore be found to frequent the country he has investigated. It does not follow of necessity that any of these birds are

actually existing undiscovered in Costa Rica ; but when a species has been observed both north and south of the Republic, it is very likely indeed that somewhere in its varied climate such a species may occur ; where, however, a species is only to be found on one side, the chances that its range extends beyond are much more hypothetical. Mr. Lawrence gives a list of sixty-two species which *may* occur in Costa Rica. Of these, twenty-six are found both further north and further south, the rest extend their range only to the confines of the Republic*.

TURDIDÆ.

No less than five species of *Catharus* are found in Costa Rica ; and a sixth, *C. griseiceps*, Salv., which Mr. Lawrence omits from his possible additions, is found in Veragua. The difference observed between this when compared with Lafresnaye's type of *C. fuscata* is perhaps sexual rather than seasonal. Female *Cathari*, at least of the dark *Malacocichla* group, are usually paler on the back, and have the bill darker. The bill in some male specimens of *Catharus* is orange or yellow, as in many of the true Thrushes. Since writing my notes on Veragua birds I have seen three additional specimens of *Turdus obsoletus*, all closely resembling one another, and one of which was marked "male." I am therefore now inclined to abandon the supposition that these specimens are females of some black-coloured male of which we have not yet seen examples, and to come round to Mr. Lawrence's view that both sexes are coloured alike, and that the species must be placed near *T. grayi*.

TROGLODYTIDÆ.

There seems to be some confusion respecting the types of *Troglodytes tessellatus*, D'Orb. & Lafr. Mr. Whitely has sent in specimens from Arequipa which agree well with the Paris specimens marked *tessellatus*, collected by d'Orbigny at Tacna. These hardly differ from the Panama Wren.

* It may be remarked that *Pyranga hepatica* of Mr. Lawrence's Veragua list is *P. testacea*, ScL. & Salv., and *Grallaria guatemalensis* is *G. princeps*, ScL. & Salv.

MNIOTILTIDÆ.

Arcé obtained specimens of *Dendræca vieilloti* at Tempate, on the Pacific coast. *Setophaga aurantiaca*, Baird, is exceedingly like *S. verticalis*, D'Orb. & Lafr. I cannot distinguish them with certainty. *S. flammea*, Cab. (J. f. Orn. 1861, p. 85), refers to the same species, and is not the true *flammea* of Guatemala: I have seen the Berlin specimen. *Basileuterus melanotis*, Lawr., described in the paper I am noticing, I do not know; it is said to differ from all the allied species in the decided black colouring behind the eye, in the superocular stripe being of a clear ash-colour, without any tinge of yellow or greenish, and in its paler lower plumage.

HIRUNDINIDÆ.

I cannot distinguish between *Stelgidopteryx fulvigula*, Baird, of which we have a marked specimen received from the Smithsonian Institution, and our Guatemalan examples of *S. fulvipennis*, Scl.

VIREONIDÆ.

The species obtained by Arcé at Tucurriquei and referred by me to *Hylophilus decurtatus* (or *H. cinereiceps*) must certainly be the same as Mr. Lawrence's *H. pusillus*, whichever name be adopted for the Costa-Rican bird.

The same remark applies to *Cyclorhis flaviventris* from the Gulf of Nicoya, and *C. subflavescens*. There is but one *Cyclorhis* in Costa Rica, which must be called *C. subflavescens*, Cab.

TANAGRIDÆ.

Phænicothraupis carmioli, described in this paper, appears to be a very distinct species. We have a single specimen, also obtained by Carmiol. As Mr. Lawrence remarks, even if all the three known specimens were females, they cannot be associated with any known species.

FRINGILLIDÆ.

Amaurospiza concolor, Cab., has not been obtained by any of

the Smithsonian collectors or correspondents. We have a single skin, procured on the Panama railway line.

Pyrgisoma biarcuatum and *P. kieneri* both refer to the same species, which we have called *Pyrgisoma cabanisi* (see P. Z. S. 1868, p. 324, and Exot. Orn. pl. lxx. fig. 1).

Young males and females of *Chrysomitris mexicana* have the rectrices dark, and are without the white mark observable in the male. I have some doubts as to the determination of the specimens called *C. columbiana*, and think it very possible that they should be referred to the Central-American race *C. mexicana*, and not to the New-Granadian form, which has the rectrices of a uniform black.

CORVIDÆ.

A family so largely represented in Mexico and Guatemala by a number of species, in Costa Rica contains but a single species, which should be called *Psilorhinus mexicanus*, Rüpp., as it differs from the true *P. morio*, Wagl., in having the lower parts and extremities of the rectrices white instead of sooty brown.

DENDROCOLAPTIDÆ.

Oxyrhynchus flammiceps is *O. frater*, ScL. & Salv. (P. Z. S. 1868, p. 326, and Exot. Orn. pl. lxxi.). *Picolaptes compressus* and *P. lineaticeps* of Mr. Lawrence's Catalogue both refer to the same species, which should be called *P. compressus* (Cab. J. f. Orn. 1861, p. 243).

FORMICARIIDÆ.

Thamnophilus doliatus and *T. affinis* also refer to one species, *T. affinis*, Cab. *Gymnocichla nudiceps* is *G. chiroleuca*, ScL. & Salv., a species we have only recently separated (Proc. Zool. Soc. June 1869).

TYRANNIDÆ.

The species called *Platyrrhynchus cancrominus* by Mr. Lawrence is, I think, very likely to be the Ecuadorean *P. albugularis*, ScL., of which Mr. F. Godman and I have specimens, from Costa Rica and Veragua, agreeing with Mr. Selater's types. *Mionectes olivaceus*, Lawr., is closely allied to *M. striaticollis*, Lafr., but, having the head olivaceous instead of plumbeous, is,

I think, sufficiently distinct. It is also found in Veragua and Panama. *M. assimilis* and *M. oleagineus* must refer to one species; whether *M. assimilis*, Scl., can ultimately be retained as distinct from the southern bird is, I think, doubtful.

Our specimens of *Tyranniscus* from Costa Rica, including one from the Smithsonian Institution marked *T. vilissimus*, are considerably smaller than Guatemalan specimens, and, if anything, even smaller than those from Panama. Unless both races occur in Costa Rica the bird should, I think, be called *Tyranniscus parvus*, Lawr.

Rhynchocyclus griseimentalis, described from Costa Rica, I cannot distinguish from the Guatemalan bird. We have one Costa-Rican specimen, and several from Veragua, all of which agree with one another and with our series from Guatemala. Mr. Lawrence must not depend too much upon the locality assigned to his Mexican specimen. "Mexique" has a wide signification sometimes!

Mitrephorus phaeocercus and *M. aurantiiventris* refer to one species, *M. aurantiiventris*, Lawr. The specimens sent by Arcé were not in good condition; and although I recognized certain differences between them and Guatemalan examples of *M. phaeocercus*, I did not feel justified in describing the Costa-Rican bird.

Myiarchus panamensis, must be erased from the list for the present.

COTINGIDÆ.

Tityra albitorques should be *T. fraseri*, Kp. (see Scl. & Salv. P. Z. S. 1867, p. 757).

BUCCONIDÆ.

I feel sure there have been too many species of *Malacoptila* separated. The differences noticeable will, I believe, be found in many cases to be sexual and not specific.

Monasa peruana is *M. grandior*, Scl. & Salv. (P. Z. S. 1868, p. 327).

TROGONIDÆ.

Mr. Lawrence has sent his types of *Trogon concinnus* to Mr. Gould for examination; and it is his opinion, and I agree with

him, that this supposed species has been based upon immature specimens of *T. caligatus*, Gould. Mr. Lawrence describes the female of my *T. clathratus*; but he will find it already characterized (P. Z. S. 1867, p. 151). *Trogon bairdi*, described by Mr. Lawrence, is a fine new species bearing the same relationship to *T. venustus* (Cab.) that *T. puella* does to *T. aurantiiventris*.

TROCHILIDÆ.

Eugenes spectabilis. I do not think this species satisfactorily established as yet, and believe that it may prove to be *E. fulgens*, Sw., which *undoubtedly does occur* in Costa Rica. All the specimens of *Heliodoxa jacula* that have passed through Mr. Lawrence's hands appear to have been immature. Mr. Godman and I have specimens both from Costa Rica and Veragua possessing the bright frontal and gular spots very conspicuously. In his remarks upon the vexed question as to the position of *Oreopyra castaneiventris*, Mr. Lawrence overlooks the presence in that bird of the long postocular stripe which extends backwards from the eye. This character alone, in my opinion, shows that the bird has no near relationship to *Panterpe insignis*.

Whatever name be applied to the Costa-Rican *Heliomaster* of the *H. longirostris* group, it is very improbable that more than one is found in the country. I should, for reasons before given (P. Z. S. 1867, p. 155), call it *H. longirostris*, Vieill., while Mr. Lawrence prefers *H. sclateri*, following Cabanis. If the races are to be maintained as distinct, their range is anomalous. It is as follows:—Vieillot's *H. longirostris* is from Venezuela or Trinidad; Dr. Cabanis's *H. sclateri*, also from Venezuela, and according to both him and Mr. Lawrence from Costa Rica; Mr. Lawrence's *H. stuartæ*, from Bogota and Panama. I am not convinced that the Guatemalan *H. pallidiceps* is really separable; but as far as I can see, the head is constantly lighter in colour than in the more southern bird. *Eupherusa eximia* is probably the bird Mr. Sclater and I have recently separated as *E. egregia* (P. Z. S. 1868, p. 389).

RHAMPHASTIDÆ.

Rhamphastus approximans, Cab., if kept separate from *R. cari-*

natus, must surely be called *R. brevicarinatus*, Gould, the types of which came from Panama. Cassin's reasons for keeping three species are unsatisfactory, and to my mind point to a conclusion opposed to that at which he arrives—viz. that they should all be united.

ACCIPITRES.

Asturina nitida is *A. plagiata*, Schl. (see *Scl. & Salv. P. Z. S.* 1869, p. 130). *A. magnirostris* is *A. ruficauda*, *Scl. & Salv. (tom. cit. p. 133, and Exot. Orn. pl. lxxxviii.)*. *Accipiter pileatus* is *A. bicolor*, Vieill. (see *Scl. & Salv. Exot. Orn. pl. lxix.*). *Rosthramus sociabilis*, though, doubtless, to be found in Costa Rica, must for the present be erased from the list of its birds. We have no specimen from the Gulf of Nicoya, nor can I find any mention of the species in our manuscript lists of Arcé's collections.

COLUMBIDÆ.

Chlorœnas subvinacea, described by Mr. Lawrence in the present paper, seems to be distinct from *Columba nigrirostris*, *Scl.* We have no specimen which we can refer with certainty to the true *C. vinacea* of Temminck, whose plate is hardly satisfactory enough to enable me to make a comparison. The three species, if there are three, are very closely allied. *Geotrygon cæruleiceps*, also described by Mr. Lawrence, is *G. chiriquensis*, *Scl.* (see *Exot. Orn. pl. lxii.*)*. *G. costaricensis*, another species of this difficult group, I do not know; it is said to belong to the group containing *G. caniceps* and *G. cristata*, and, I suppose, also *G. veraquensis*, Lawr., from the neighbouring country of Chiriqui.

CRACIDÆ.

Penelope purpurascens. Costa-Rican specimens in our collection agree with others from Panama, and differ materially from Guatemalan examples in having the lower part of the back and belly of a deep chestnut. I am not yet satisfied as to the proper designation of this bird, which may be *P. cristata*, Linn.; but it agrees fairly with Spix's figure of his *Penelope jacuaca*, and with the specimens in the British Museum thus named. *Orta-*

* [Cf. *suprà*, p. 110.—ED.]

lida poliocephala is *O. cinereiceps*, Gray, and belongs to the same group (with red primaries) which contains *O. garrula*, Humb. & Bonpl. The same species has also been called *O. poliocephala* by Mr. Lawrence, as well as by Mr. Sclater and myself, in our respective papers on Mr. McLeannan's Panama collections, and by me in my list of Arcé's Veraguan birds.

Mr. Lawrence includes several species, from Warszewicz's collection, which, though belonging to the fauna, have not yet been found within the political limits of Costa Rica. They are :—

1. *Lampornis veraguensis*, Chiriqui.
2. *Chalybura isauræ*, „
3. *Microchæra albocoronata*, „
4. *Oreopyra leucaspis*, „
5. *Erythronota niveiventris*, „
6. *Sapphironia cæruleogularis*, „

The species to be taken out altogether are fourteen in number, viz. :—

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| 1. <i>Hylophilus pusillus</i> . | 8. <i>Mitrephorus phæocercus</i> . |
| 2. <i>Cyclorhis flaviventris</i> . | 9. <i>Mionectes oleagineus</i> . |
| ? 3. <i>Chrysomitris columbiana</i> . | 10. <i>Myiarchus panamensis</i> . |
| 4. <i>Pyrgisoma biarcuatum</i> . | 11. <i>Heliomaster pallidiceps</i> . |
| 5. <i>Picolaptes lineaticeps</i> . | 12. „ <i>sclateri</i> . |
| 6. <i>Thamnophilus doliatus</i> . | 13. <i>Trogon concinnus</i> . |
| 7. <i>Tyranniscus vilissimus</i> . | 14. <i>Rostrhamus sociabilis</i> . |

The names of the following species should be changed :—

Pyrgisoma biarcuatum and *P. kieneri* to *P. cabanisi*, Scl. & Salv.

Gymnocichla nudiceps to *G. chiroleuca*, Scl. & Salv.

?*Platyrrhynchus cancrominus* to *P. albogularis*, Scl.

Rhynchocycchus griseimentalis to *R. brevirostris*, Cab.

Tityra albitorques to *T. fraseri*, Kp.

Monasa peruana to *M. grandior*, Scl. & Salv.

Eupherusa eximia to *E. egregia*, Scl. & Salv.

Asturina nitida to *A. plagiata*, Schl.

„ *magnirostris* to *A. ruficauda*, Scl. & Salv.

Accipiter pileatus to *A. bicolor*, Vieill.

Geotrygon caruleiceps to *G. chiriquensis*, Sel.

Penelope purpurascens to *P. jacuaca*, Spix ?

Ortalia poliocephala to *O. cinereiceps*, G. R. Gray.

I now add the names of a few species to the list of Costa-Rica birds which do not as yet seem to have come under Mr. Lawrence's notice :—

1. *Cacicus microrhynchus*, Sel. & Salv. Peje (*J. Carmiol*).
2. *Dendromanes atrirostris* (Lafr.). Angostura (*J. Carmiol*).
3. *Dendromanes homochrous*, Sel. Costa Rica (*J. Carmiol*).
4. *Xenops heterurus*, Cab. Costa Rica (*J. Carmiol*).
5. *Rhamphocœnus rufiventris*, Bp. Bebedero (*Arcé*).
6. *Leptopogon pileatus*, Cab. Valza (*J. Carmiol*).
7. *Serpophaga cinerea*. Costa Rica (*Endrés*).
8. *Lophornis helenæ*, Delatt. Tucuriqui (*Arcé*).
9. *Petasophora delphinaæ*. Costa Rica (*J. Carmiol*).
10. *Clais guimeti*. Costa Rica (*Endrés*).
11. *Conurus lineolatus*. Angostura (*J. Carmiol*).
12. *Hypotriorchis ruficularis*. Costa Rica (*J. Carmiol*).
13. *Cathartes atratus*. Costa Rica (*J. Carmiol*).

It will be seen that I leave Mr. Lawrence's list as regards numbers almost where I found it, by removing fourteen species, and replacing them by thirteen others. There are then 473 species of "Land-birds" known to inhabit Costa Rica; and if the remainder equal in number the Waders and others of Guatemala, the total number of birds constituting the avifauna of Costa Rica will reach altogether to 574 or thereabouts. If to these be added the species of the adjoining countries of Veragua and Panama, so as to include the whole of the birds of the southern section of the Central-American fauna, we have a total of 630 species.

This brief summary will give some idea of the marvellous richness of the ornithic productions of this interesting and favoured country.